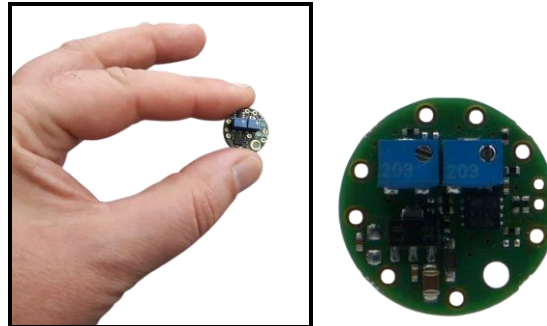


Ultra Small 18mm 3-Wire Voltage Output Load Cell Amplifier / Strain Gauge Amplifier AS200507

The AS200507 is an ultra miniature circular board for **3-wire** systems providing five voltage output options (0V-5V, 0V-10V, 2.5V-7.5V, -5V to +5V and -10V to +10V), designed to fit inside a load cell or other transducer. The unit has individual multi-turn potentiometers for the precise setting of Zero and Span. The inputs provide EMI-/RF-suppression. Transducer wires can be easily soldered onto the board.

Features

- Wide range power supply 13V-32V
- 10V stabilised bridge excitation
- Bridge resistance 350 Ohm (or greater)
- Bridge sensitivity 0.3mV/V – 3mV/V
- Size **18mm** diameter, 8.7mm height
- Fast calibration procedure
- Reverse-polarity protection
- 3D-Step model available on request



Applications

- Industrial Weighing
- Load Testing & Monitoring
- Overload Protection Systems

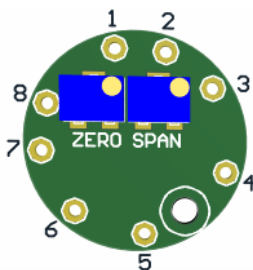
Ordering

Part number: AS200507-*

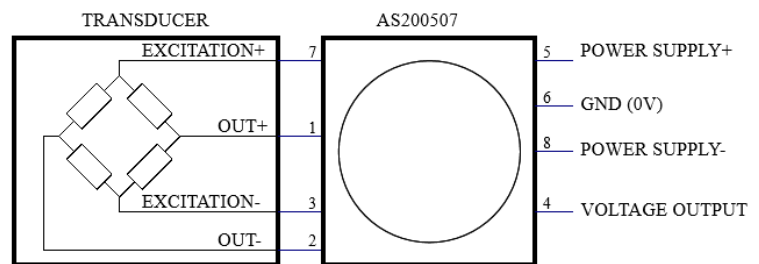
*Please specify required input range, between 0.3mV/V – 3mV/V
See Standard parts below. Other configurations available.

Customer specific electrical / mechanical changes are possible
– please contact us with your individual requirements.

Board Connections



Schematic Diagram



Specifications

Parameter	Min	Typical	Max	Unit
Supply Voltage V_{in} (unipolar voltage)	13	24	32	V
Supply Voltage V_{in} (bipolar voltage output)	-13 to -18	+/-15	+13 to +18	V
Voltage Output – Zero (adjustable control)		0.01/2.5		V
Voltage Output – Span (adjustable control)		5.0/7.5/10.0	V_{in}	V
Voltage Output – fault conditions ¹		V_{in}		V
Bridge Sensitivity	0.3		3	mV/V
Bridge Resistance	350			Ohms
Bridge Excitation Voltage		10		V
Step input response (2mV/V, 0-10V output, 10%-90%)		185		us
Frequency bandwidth (-3dB)		2		kHz
Output Temp. Coefficient – Zero		1.5		uV/°C
Output Temp. Coefficient – Span		0.01		%/°C
Operating Temperature	-20		85	°C



Installation, Calibration and Sensitivity:

1. Installation

The unit is provided with 8 pads around its periphery for the soldering of external wires. The holes in the pads are 1mm diameter (Pad size 1.8mm). The mounting hole has a diameter of 2.1mm (Pad size 4mm).

Default settings are:

- Unipolar supply (24V, Assembled R16)
- Output sensitivity: 2mV/V (R12=220R)
- Output range: 0-10V (1. Assembled R7, R17, R21, 2. Removed R18, R19)

Normally we will set-up the unit to the requirements indicated in your order. If alternative settings are required later, follow the procedures detailed below.

¹Fault condition: if there is an input overload or a disconnected transducer, the output voltage may match the applied power supply input voltage. This characteristic can be utilized to identify a faulty transducer. However, it is important to ensure that any connected devices can tolerate this voltage.

Power Supply	Board changes – see diagram end of datasheet
Unipolar supply (13 – 32V)	Assemble R16 (alternatively connect pin 6 to pin 8 if the board was previously configured for bipolar supply operation)
Bipolar supply (+/-13 to +/-18V)	Remove R16

Output Range	Board changes
2.5-7.5V	Assemble R7, R18, R19 Remove R17, R21
0-5V, 0-10V	Assemble R7, R17, R21 Remove R18, R19
+/-5V, +/-10V	Assemble R17, R21 Remove R7, R18, R19

2. Calibration

At zero load use ZERO potentiometer to set 0.01 V (or 2.5V)

At full load use SPAN potentiometer to set 10.00 V (or 5.0V or 7.5V)

Repeat above procedure several times until both settings are reached.

3. Sensitivity

The amplifier is matched to the load-cell full scale sensitivity (mV/V) by the value of resistor R12 (Top side THT) or R1 (Bottom side SMD). Assemble only R1 or R12, not both.

For 0-5V, 0+/-5V and 2.5-7.5V ranges:

$$R12 \text{ (or R1)} = 220 \times \text{mV/V} \text{ Ohms}$$

Example: load-cell is 2mV/V. Therefore when configured for 0-5V voltage output, $R1 = 220 \times 2 = 440$ Ohms. Use 430R nearest value.

For 0-10V and 0+/-10V ranges:

$$R12 \text{ (or R1)} = 110 \times \text{mV/V} \text{ Ohms}$$

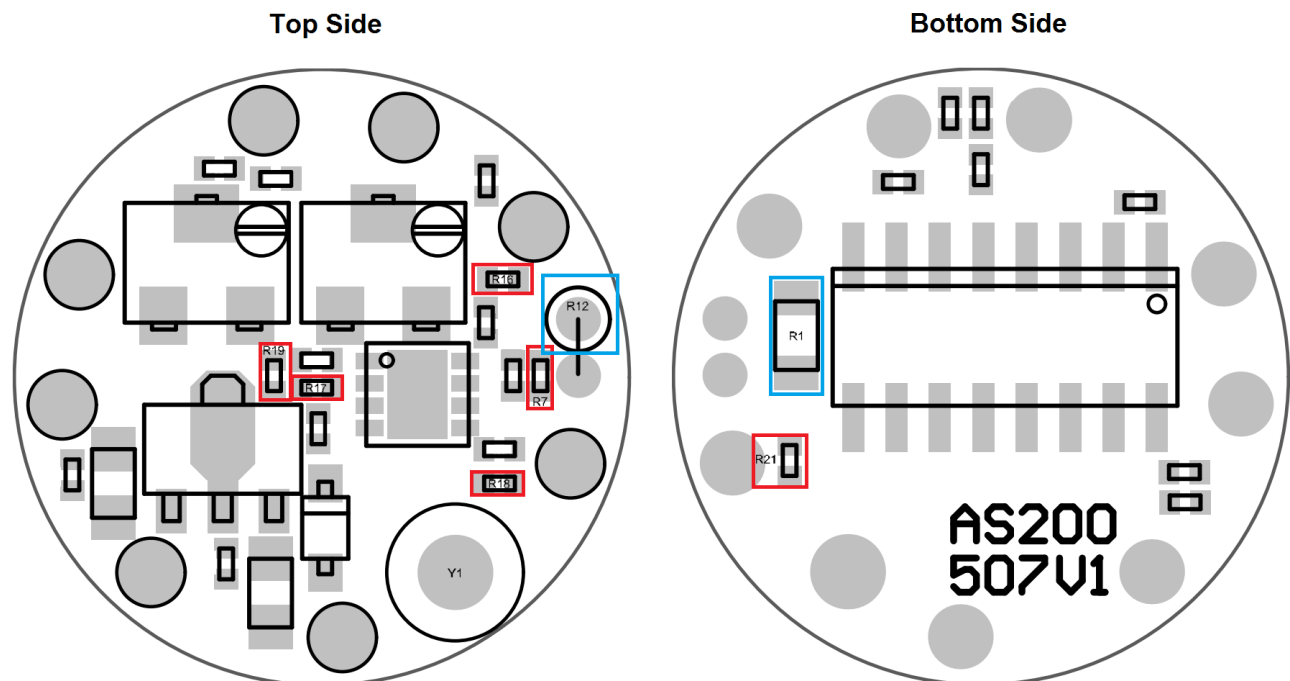
Example: load-cell is 2mV/V. Therefore when configured for 0-10V voltage output, $R1 = 110 \times 2 = 220$ Ohms.

If the calculated resistor value is not readily available use the nearest value.

Resistor should be 1% 100ppm/C 1/8 watt grade or better. Use either THT (1/8 watt) or SMD 0805.

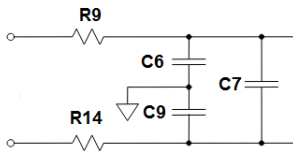
Example: THT MF12 series from Farnell Electronics: 100R, Part MF 12 100R, Order code: 9342397.

All other resistors R7, R16, R17, R18, R19, R21 are 0R (Jumper) 0402. Farnell order code: 1652737



4. Low-Pass Input Filter

The amplifier has a low-pass input filter, consisting of resistors R9, R14 and capacitors C6 and C9 in conjunction with C7, which can be used as a general purpose common-mode/differential mode EMI/RFI filter. Default values are R9=R14=0R, C6=C9=10nF, C7=not assembled.



assuming that $C7 \gg C6$

CM filter bandwidth (Hz) = $1 / (\pi \cdot R9 \cdot C6)$

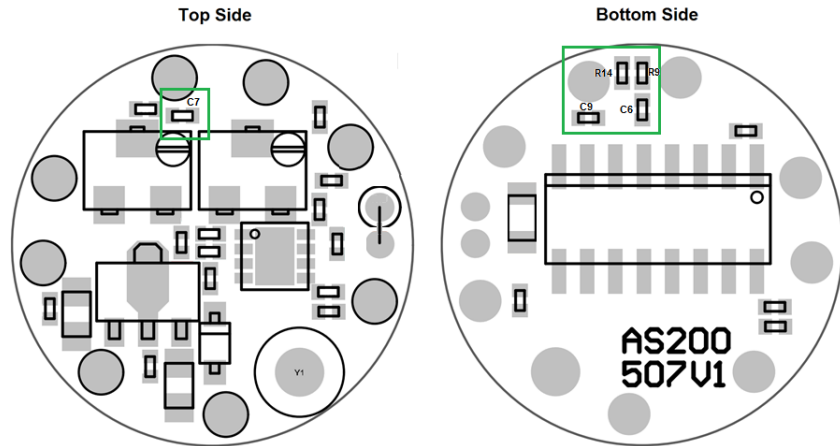
DM filter bandwidth (Hz) = approx. $1 / (4 \cdot \pi \cdot R9 \cdot C7)$

$$t_{diff} = (R9 + R14) \cdot \left[\frac{C6 \cdot C9}{C6 + C9} + C7 \right]$$

$$t_{cm} = R9 \cdot C6 = R14 \cdot C9$$

$$t_{diff} > 10 \cdot t_{cm}$$

$$R9 \cdot C6 = R14 \cdot C9$$



R9=R14 should be 1% resistors SMD 0402
C6=C9 should be <5% capacitors SMD 0402

5. Standard Parts

Order Code	Description
AS200507-2.0MV-0-5V	Input sensitivity: 2mV/V, Output voltage 0V-5V
AS200507-2.0MV-0-10V	Input sensitivity: 2mV/V, Output voltage 0V-10V
AS200507-2.0MV-5-5V	Input sensitivity: 2mV/V, Output voltage +/-5V
AS200507-2.0MV-10-10V	Input sensitivity: 2mV/V, Output voltage +/-10V
AS200507-2.0MV-2.5-7.5V	Input sensitivity: 2mV/V, Output voltage 2.5V-7.5V